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European Business Cycle Indicators

2nd Quarter 2017

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EUROPEAN ECONOMY

A photograph of a financial chart with a pen and a tablet. The chart shows various economic indicators, including a line graph with peaks and troughs, and a bar chart below it. A silver pen lies across the chart, and a silver tablet is visible in the upper right corner.

Economic and
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European Business Cycle Indicators

2nd Quarter 2017

Special topic

- ESI and other BCS indicators vs PMI – properties and empirical performance

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OVERVIEW

Recent developments in survey indicators

- After the broad sideways movement during the first quarter of 2017, the euro-area and EU Economic Sentiment Indicators increased during the second quarter, resuming the upward trend that started in the second half of 2016. At 111.1 (euro area) and 111.3 (EU) points, economic sentiment is significantly above its long-term average of 100, at levels which were last witnessed close to ten years ago.
- The improvement was broad-based across sectors: euro-area confidence brightened among consumers and in all business sectors except for services, where it remained broadly stable. Increases were particularly strong among consumers and in the construction and industry sectors. Developments were similar in the EU, with the exception of the retail trade sector where confidence remained broadly unchanged.
- Also from a country perspective, developments compared to March were generally positive. Economic sentiment improved most markedly in France (+4.7), but also in Germany (+2.7), Spain (+2.0), Poland (+1.3) and the Netherlands (+1.0), while it changed little in Italy (+0.5) and decreased in the UK (-0.9).
- Capacity utilisation in manufacturing continued on a slow but steady upward trend (+0.1 and +0.3 percentage points in the euro area and the EU, respectively). The rate stands at 82.6% in the euro area and 82.4% in the EU, around 1½ percentage points above long-term average. Capacity utilisation in services remained unchanged in the euro area (89.4%) and increased slightly in the EU (+0.3 percentage points to 89.6%). This is around 1¼ percentage points above the average since 2011.

Special topic: ESI and other BCS indicators vs PMI – properties and empirical performance

The Economic Sentiment Indicator (ESI) derived from the European Commission's BCS survey programme and the PMI index of IHS Markit Economics are probably the two most commonly used indicators for tracking euro-area GDP growth/economic activity. Despite overall very similar graphical representations, the indicators show several structural differences, e.g. in terms of publication policy, the sectors included, the questions included in the indicators, the countries included in the sample, the seasonal adjustment method, etc.

Overall, the performance of the two sets of indicators, both in terms of correlations and out-of-sample nowcast errors, is similar. The BCS indicators are generally better in predicting year-on-year growth of their references series. While there used to be a slight advantage for the PMI in nowcasting quarter-on-quarter growth, more recently, the BCS indicators and the PMI appear to perform at par.

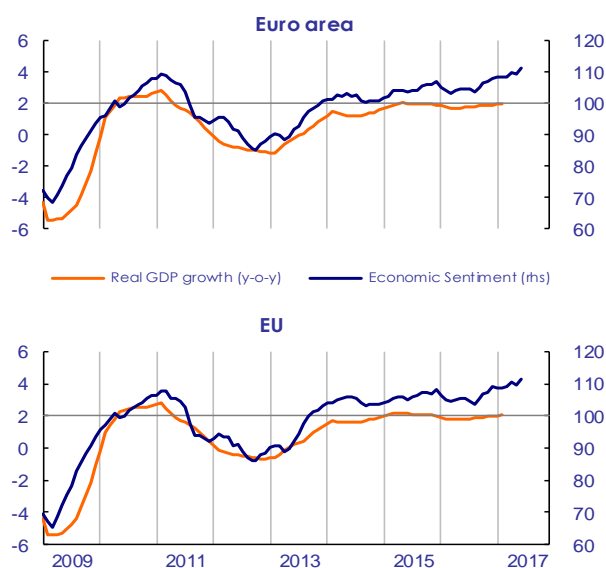
Finally, while our special topic focuses on the 'horse race' between BCS and PMI indicators in nowcasting macroeconomic aggregates, it is important to note that the BCS programme has a significantly broader coverage at the country, sector, question and sample size level, yielding a much more complete and detailed picture of economic developments.

1. RECENT DEVELOPMENTS IN SURVEY INDICATORS

1.1. EU and euro area

Following the stabilisation at elevated levels during the first quarter of 2017, the euro-area and EU Economic Sentiment Indicators (ESI) increased during the second quarter of 2017, resuming the upward trend that took hold in mid-2016. Currently standing at 111.1 (euro area) and 111.3 (EU) points, economic sentiment is not only significantly above its long-term average of 100 (see Graph 1.1.1), but at levels which were last witnessed close to ten years ago (August 2007).

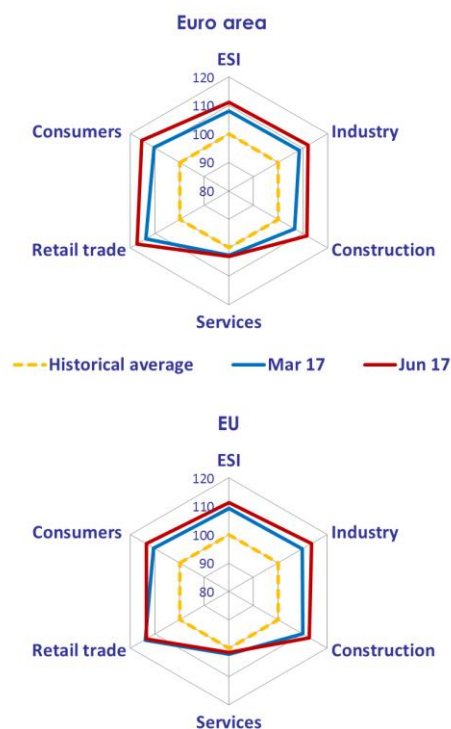
Graph 1.1.1: Economic Sentiment Indicator



Note: The horizontal line (rhs) marks the long-term average of the survey indicators. Confidence indicators are expressed in balances of opinion and hard data in y-o-y changes. If necessary, monthly frequency is obtained by linear interpolation of quarterly data.

Despite its slight decline in June, also Markit Economics' Composite PMI for the euro area signals a further solid rise in business activity, rounding off the strongest quarter for over six years. The Ifo Business Climate Index (for Germany) rose strongly in the course of Q2, too. The indicator currently stands at 115.1 points, the highest figure on record since 1991.

Graph 1.1.2: Radar Charts



Note: A development away from the centre reflects an improvement of a given indicator. The ESI is computed with the following sector weights: industry 40%, services 30%, consumers 20%, construction 5%, retail trade 5%. Series are normalised to a mean of 100 and a standard deviation of 10. Historical averages are generally calculated from 1990q1. For more information on the radar charts see the Special Topic in the 2016q1 EBCI.

From a sectoral perspective, in the euro area, confidence in the second quarter improved among consumers and in all the business sectors except for services, where it remained broadly stable (see Graph 1.1.2). The increases were particularly strong among consumers and in the construction and industry sectors. Developments were quite similar in the EU, with the exception of the retail trade sector where confidence remained broadly unchanged.

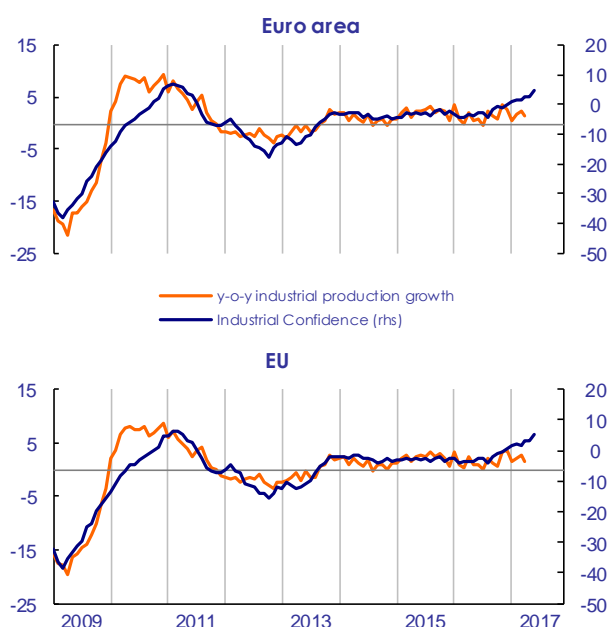
In terms of levels, euro-area and EU confidence indicators continue to be significantly above their historical means across sectors; only in the services sector, confidence has not yet risen notably beyond its long-term average.

Among the seven largest EU economies, economic sentiment improved over the quarter most markedly in France (+4.7), but also in Germany (+2.7), Spain (+2.0), Poland (+1.3) and the Netherlands (+1.0), while it remained broadly stable in Italy (+0.5) and decreased in the UK (-0.9).

Sector developments

Industrial confidence in both the euro area and the EU improved strongly, completing the second quarter around 3¼ points higher than the preceding one. As illustrated by Graph 1.1.3, industry confidence is high by historic standards, at levels last seen in early 2011.

Graph 1.1.3: Industry Confidence indicator



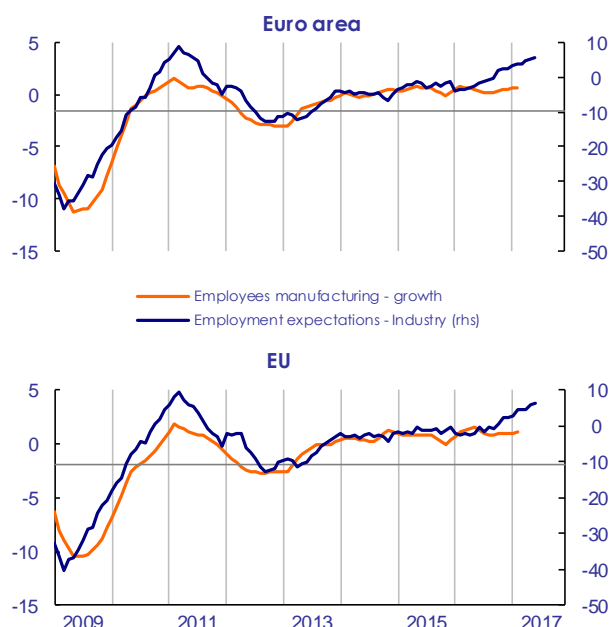
In both European aggregates, the strong increase of the confidence indicator was fuelled by a sharp improvement in managers' assessment of their order books and, less markedly, their stocks of finished products. By contrast, managers' production expectations remained broadly stable.

Of the components not included in the confidence indicator, managers' assessment of export order books improved markedly in both areas, while their assessment of past production improved markedly in the euro area and modestly in the EU.

Euro-area and EU selling price expectations decreased during the second quarter of 2017,

interrupting the upward trend that set in in the third quarter of 2016. Managers' employment expectations continued to improve, perpetuating the upward trend that started in the beginning of 2016 (see Graph 1.1.4).

Graph 1.1.4: Employment - Industry Confidence indicator

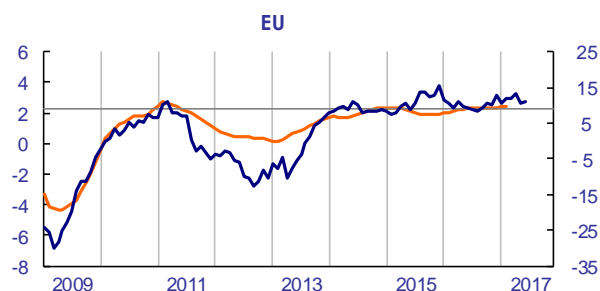
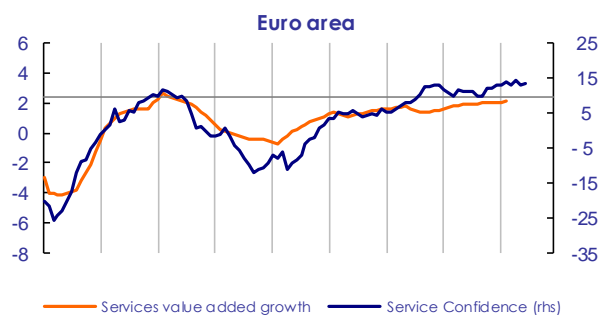


Focussing on the seven largest EU economies, a comparison of March and June readings shows sharply improved industry confidence in France (+5.8), Germany (+4.8) and the UK (+3.3). In the latter, confidence reached its highest level since 1990. To a lesser extent, confidence improved also in Spain and Poland (both +1.6). Confidence in the Netherlands (+0.8) and Italy (+0.6) showed little change on the quarter.

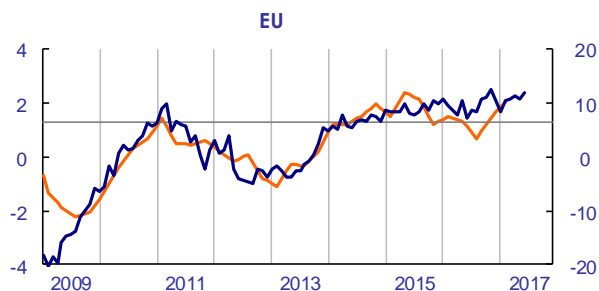
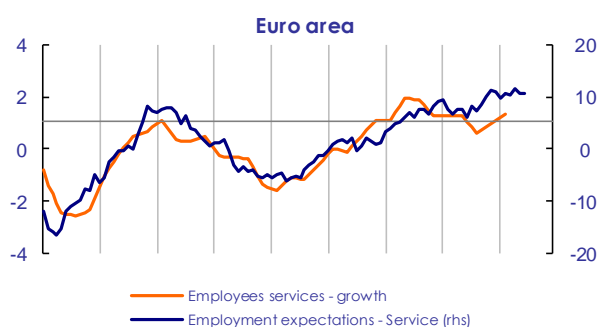
The latest results of the quarterly manufacturing survey (April) showed **capacity utilisation in manufacturing** continuing on a slow but steady upward trend (+0.1 percentage points in the euro area, +0.3 percentage points in the EU). Currently, capacity utilisation is at 82.6% in the euro area and 82.4% in the EU, above their respective long-term averages (at 81.0% and 80.7, respectively).

Services confidence remained broadly unchanged in both the euro area (+0.6) and in the EU (-0.8) over the quarter. Both indicators score only slightly above their long-term averages (see Graph 1.1.5).

Graph 1.1.5: Services Confidence indicator



Graph 1.1.6: Employment - Services Confidence indicator

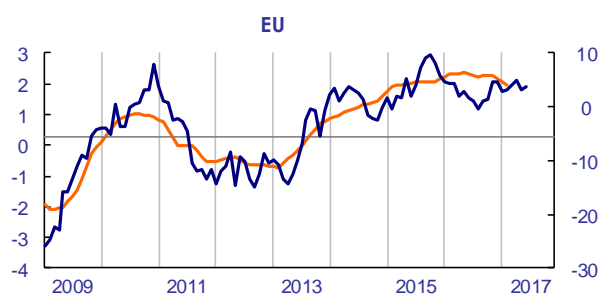
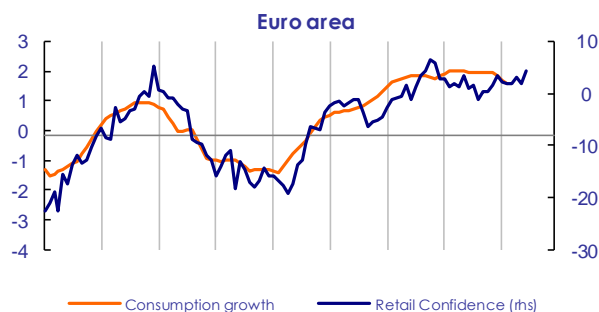


Looking at the components of services confidence, assessments of the past business situation and past demand remained broadly stable in both areas. Managers' demand expectations remained broadly unchanged in the euro area too, but worsened slightly in the EU.

Compared to the end of Q1, **retail trade confidence** increased in the euro area (+2.6), while it remain broadly stable in the EU (-0.4). Both indicators stand comfortably above their long-term averages (see Graph 1.1.7).

Compared to the end of Q1, service managers' employment expectations in June remained virtually unchanged in the euro area and improved marginally in the EU (see Graph 1.1.6). Selling price expectations stayed broadly unchanged in both the euro area and the EU.

Graph 1.1.7: Retail Trade Confidence indicator



Among the seven largest EU Member States, confidence in the services sector brightened markedly in Spain (+4.3) and moderately in Italy (+1.8), while remaining broadly unchanged in the Netherlands (+0.4) and in Poland (-0.6). By contrast, confidence worsened in Germany (-2.0) and France (-1.8), and more severely so in the UK (-7.8).

Improved confidence in the euro area results from marked upturns in managers' views on the past and future business situation, which were partly offset by a worsening assessment of the volume of stocks. Also in the EU, managers became more cautious about the volume of their

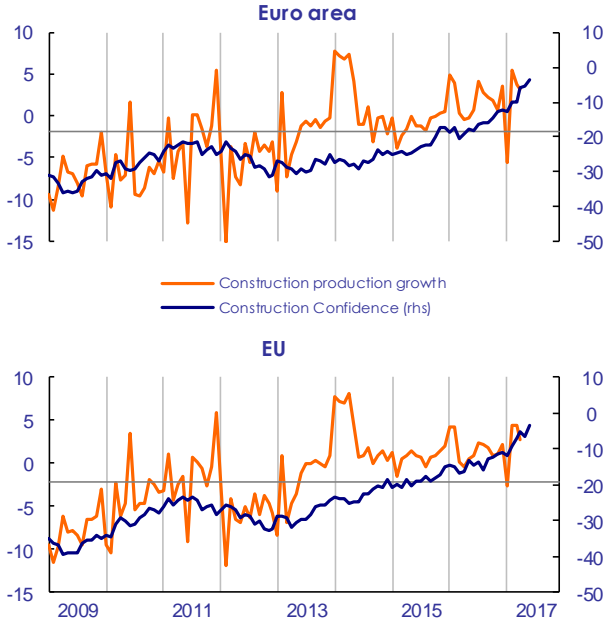
Capacity utilisation in services, as measured by the April wave of the dedicated quarterly survey, remained unchanged in the euro area and increased slightly in the EU (+0.3). The current rates of 89.4% (euro area) and 89.6% (EU) correspond to levels above the respective long-term averages (calculated from 2011 onwards) of 88.2% and 88.3%.

stocks and reported an increase in their past business activity; however, their expectations on business activity remained broadly stable.

Confidence among managers in the retail trade sector improved particularly sharply in Germany (+6.3), but also in Spain (+3.1), the Netherlands (+2.7) and Poland (+1.1), while it remained broadly stable in France (-0.2) and Italy (-0.5). By contrast, confidence in the UK plummeted over Q2, losing 14.2 points compared to the end of Q1.

Construction confidence continued the recovery it had embarked upon in 2013. In both the euro area and the EU managers were much more upbeat (+6.4 and 3.3 points on the quarter, respectively).

Graph 1.1.8: Construction Confidence indicator



In terms of the components making up the indicator, both EU and euro-area managers reported much more positive appraisals of both their current order books and employment expectations.

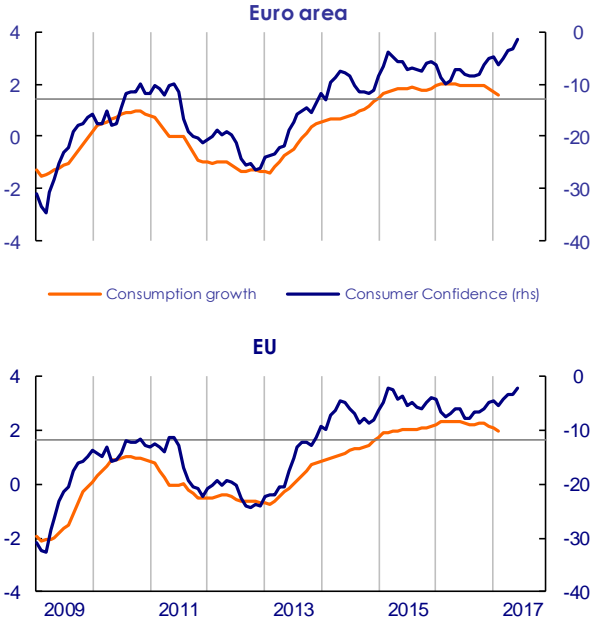
In the seven largest EU economies, construction confidence increased sharply in Spain (+18.2) and France (+9.2), but also in Germany (+4.5), Poland (+2.7) and Italy (+2.4). In the Netherlands confidence remained broadly stable (-0.5), while in the UK the indicator was 8.2 points lower in June than in March 2017, which, however, was a positive outlier. In a longer-term perspective, UK construction

confidence remained well above its long-term average.

Consumer confidence improved substantially in the euro area (+3.8) and, to a lesser extent, in the EU (+2.2). Both indicators are soaring close to historical highs (see Graph 1.1.9).

In both areas, consumers were much more optimistic concerning the future general economic situation of their country and unemployment developments over the next 12 months. Consumers' expectations on their personal financial situation remained broadly stable. Savings expectations remained broadly unchanged in the EU, but increased in the euro area.

Graph 1.1.9: Consumer Confidence indicator

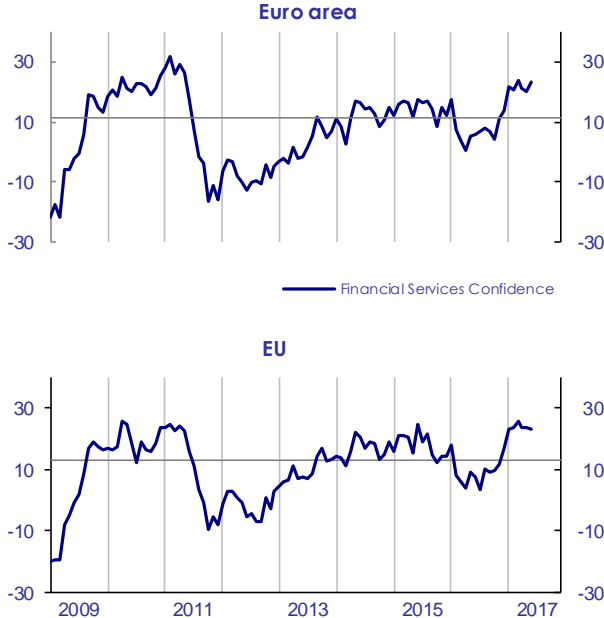


In the seven largest EU economies, the positive developments at aggregate level were fuelled by a very strong increase in France (+10.3), and still strong increases in Germany (+4.8), Spain (+3.6) and Poland (+2.2). By contrast, confidence worsened in the Netherlands (-1.8), Italy (-2.7) and the UK (-3.1).

Euro-area confidence in the **financial services** (not included in the ESI) remained broadly stable (-0.6). While the indicator for the EU registered a decrease (-2.7), both indicators broadly maintained the plateau level reached at the end of Q1, close to levels achieved in 2011 (see Graph 1.1.10).

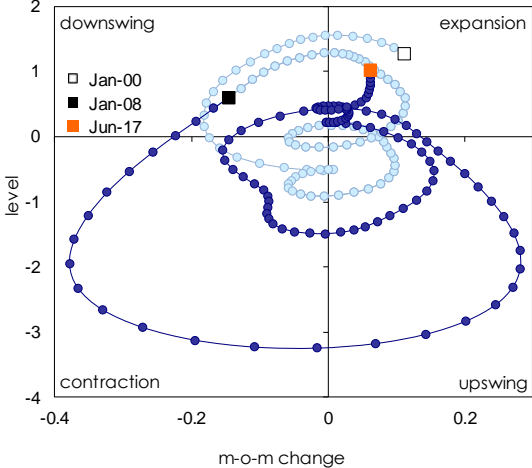
In both regions, appraisals of the past business situation worsened marginally, while managers' assessment of past demand were broadly unchanged. Managers' demand expectations remained broadly stable in the euro area, while they decreased marginally in the EU.

Graph 1.1.10: Financial Services Confidence indicator



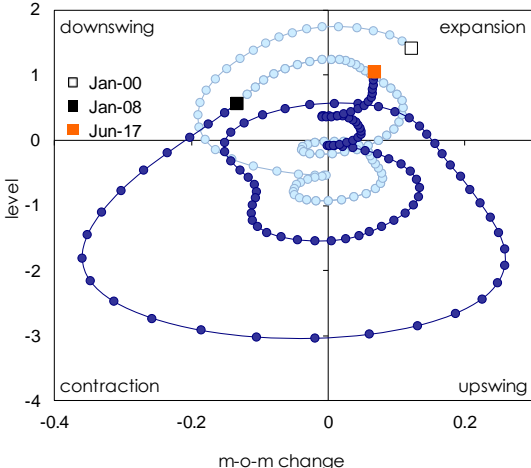
with the overall economic tracers in so far as all of them indicate economic expansion, as in March. However, the services indicator (both areas) and the EU retail trade indicator are approaching the frontier to the downswing area.

Graph 1.1.12: EU Climate Tracer



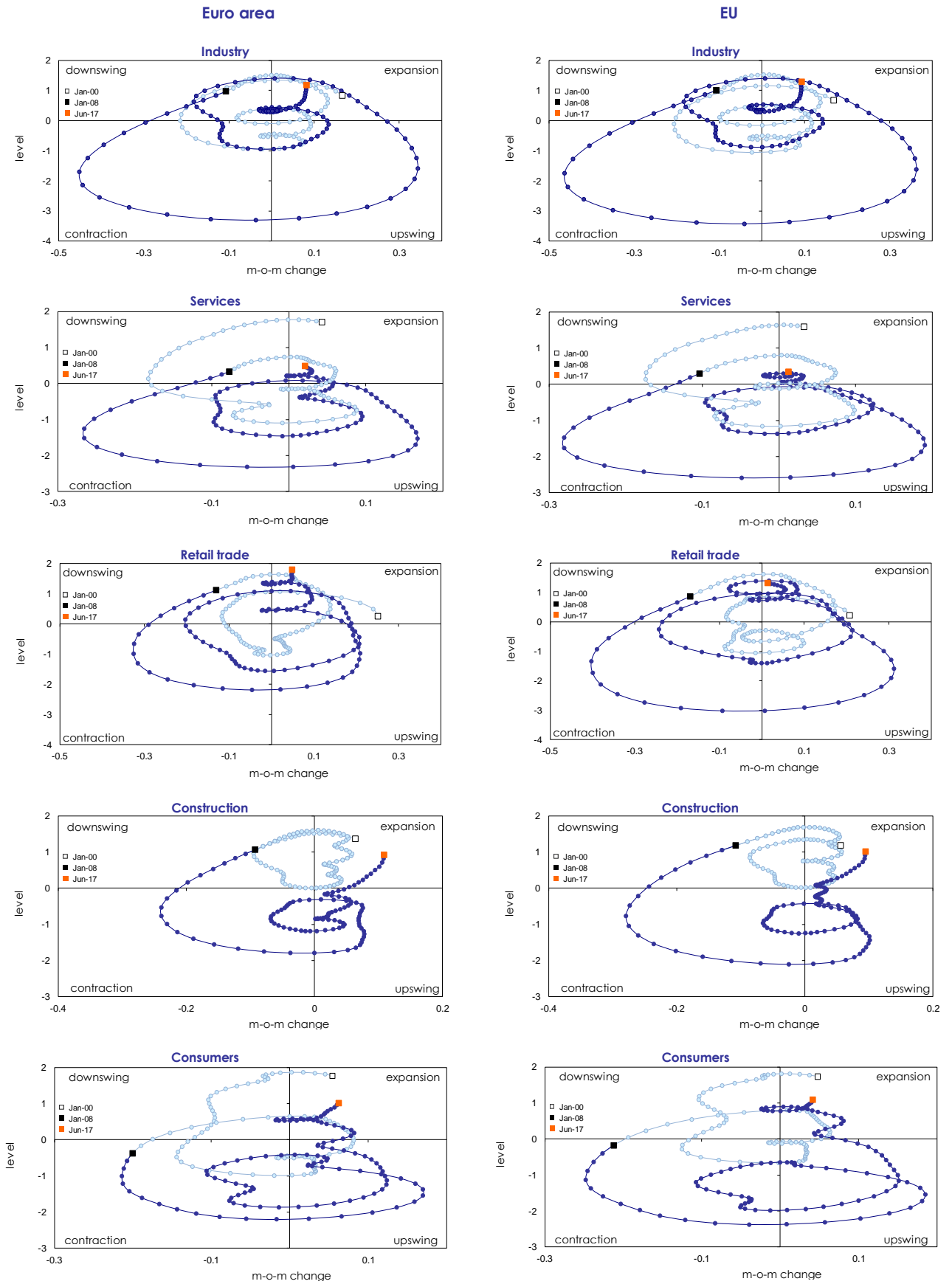
The very positive developments in euro-area and EU survey data over the second quarter are illustrated by the evolution of the **climate tracers** (see Annex for details).

Graph 1.1.11: Euro area Climate Tracer



The economic climate tracers for the euro area and the EU are plainly settled in the expansion area, even slightly firmer than in March 2017 (see Graphs 1.1.11 and 1.1.12). The sectoral climate tracers (see Graph 1.1.13) are in line

Graph 1.1.13: Economic climate tracers across sectors

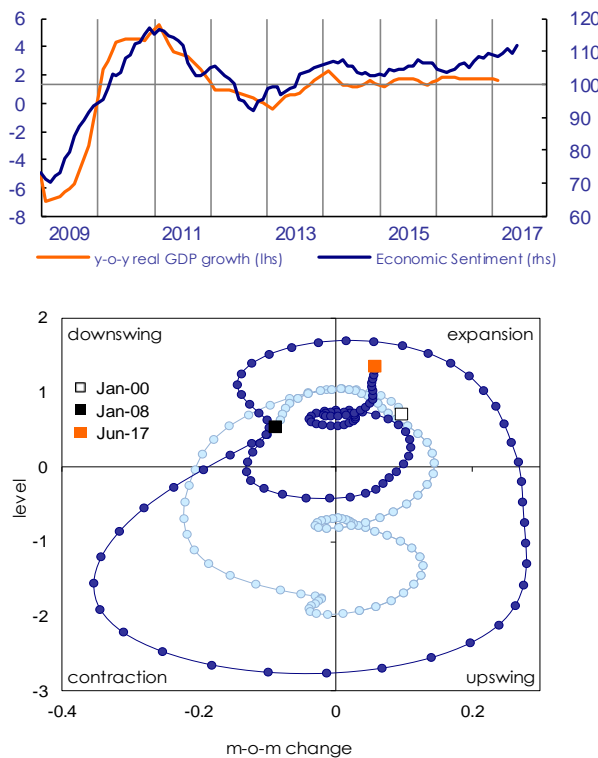


1.2. Selected Member States

Over the second quarter of 2017, changes in sentiment were positive in almost all big Member States. While the improvement was small in Italy, sentiment worsened somewhat only in the UK.

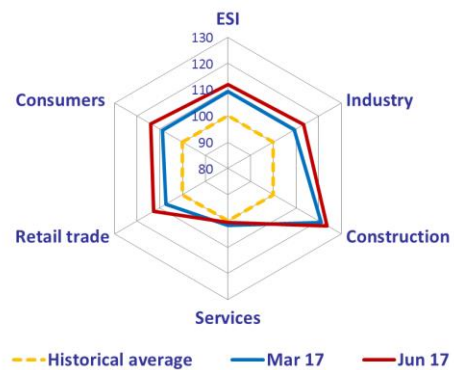
In **Germany**, better sentiment in April and June was moderated by a drop in May, resulting in a net increase of 2.7 points over the quarter. At 111.9 points, the indicator has climbed significantly above its long-term average of 100. In terms of the climate tracer (see Graph 1.2.1), the German economy asserted its position in the expansion quadrant.

Graph 1.2.1: Economic Sentiment Indicator and Climate Tracer for Germany



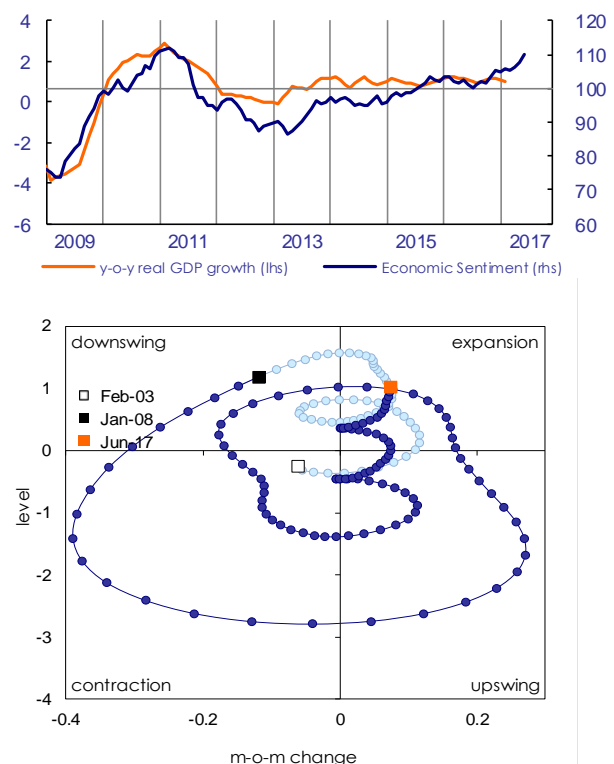
From a sectoral perspective, confidence improved markedly among consumers and in all business sectors except for services, where the indicator registered a small decrease. While the other indicators - in particular for construction - extended the distance to their respective long-term averages (see Graph 1.2.2), the services indicator is only very slightly above its average.

Graph 1.2.2: Radar Chart for Germany



In **France**, sentiment improved throughout the second quarter, resulting in a strong plus compared to March (+4.7). At 109.8 points, the headline indicator now posts markedly above its long-term average of 100. Accordingly, the French climate tracer (see Graph 1.2.3) is firmly settled in the expansion quadrant.

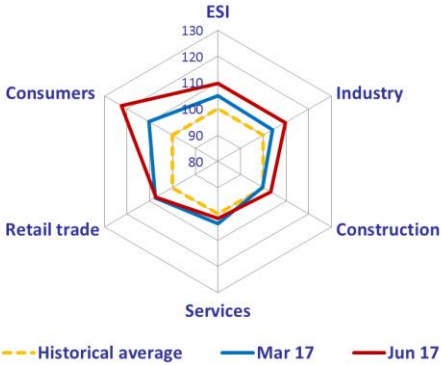
Graph 1.2.3: Economic Sentiment Indicator and Climate Tracer for France



A look at the French radar chart (see Graph 1.2.4) shows that only the services sector sent mildly negative signals, while confidence improved strongly in industry and construction and remained virtually unchanged in the retail trade sector. Consumer confidence surged by more than 10 points over the quarter, with the

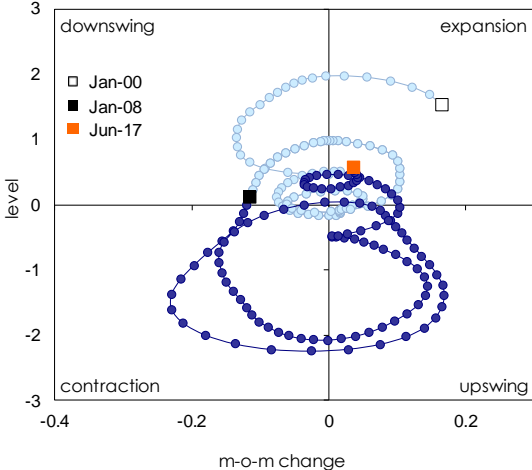
particularly steep increase of June (+7.5) suggesting an impact of the recent elections on consumers' perceptions. In terms of levels, sentiment remained comfortably above its long-term average in retail trade, and extended the positive gap in industry, construction and, particularly, among consumers. Only services confidence stands just above its long-term average.

Graph 1.2.4: Radar Chart for France



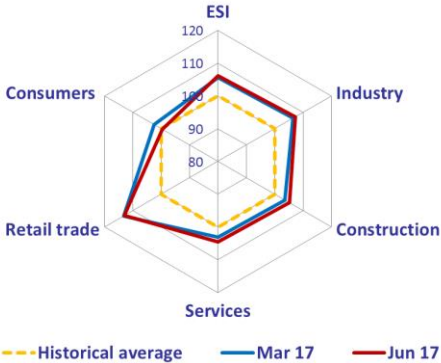
The **Italian** ESI improved markedly in April, but then decreased in May and remained virtually unchanged in June, resulting in a broadly unchanged level (+0.5) over the quarter. At 106.1 points, the Italian ESI consolidated its position above the long-term average of 100. As Graph 1.2.5 shows, in Q2, the Italian climate tracer remained in the expansion area.

Graph 1.2.5: Economic Sentiment Indicator and Climate Tracer for Italy



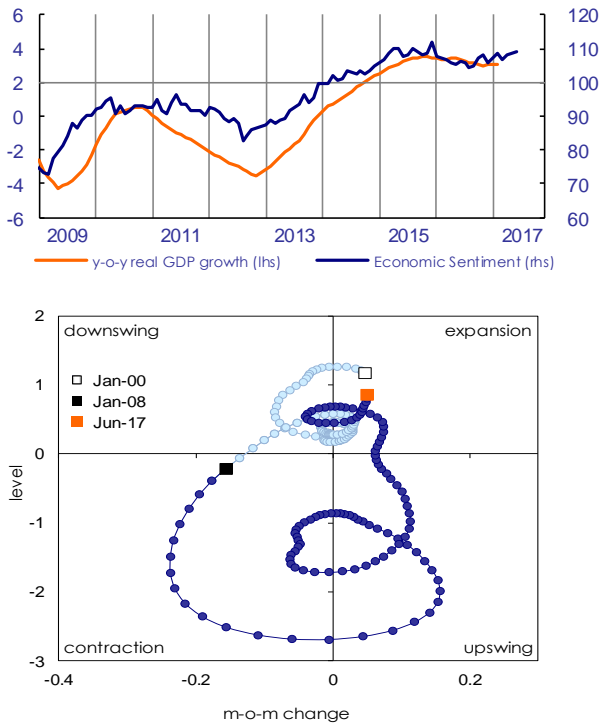
Looking at the evolution across sectors (see Graph 1.2.6), confidence improved mildly in services and construction, while it clouded over among consumers and remained broadly stable in the industry and retail trade sectors. With the exception of consumer confidence, all sectoral confidence indicators remained above their long-term averages, most notably in retail trade.

Graph 1.2.6: Radar Chart for Italy



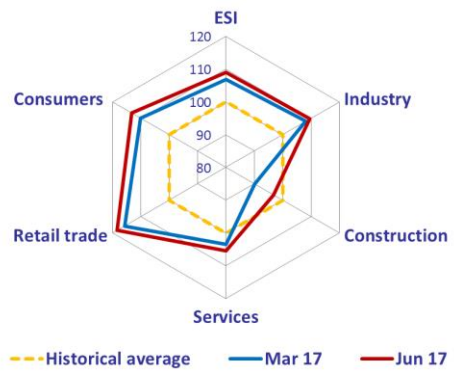
Sentiment in **Spain** improved slightly in all three months of Q2, resulting in an overall increase of the ESI by 2.0 points. At 108.9 points, the indicator extended its distance to the long-term average of 100. The climate tracer for Spain edged deeper into the expansion quadrant (see Graph 1.2.7).

Graph 1.2.7: Economic Sentiment Indicator and Climate Tracer for Spain



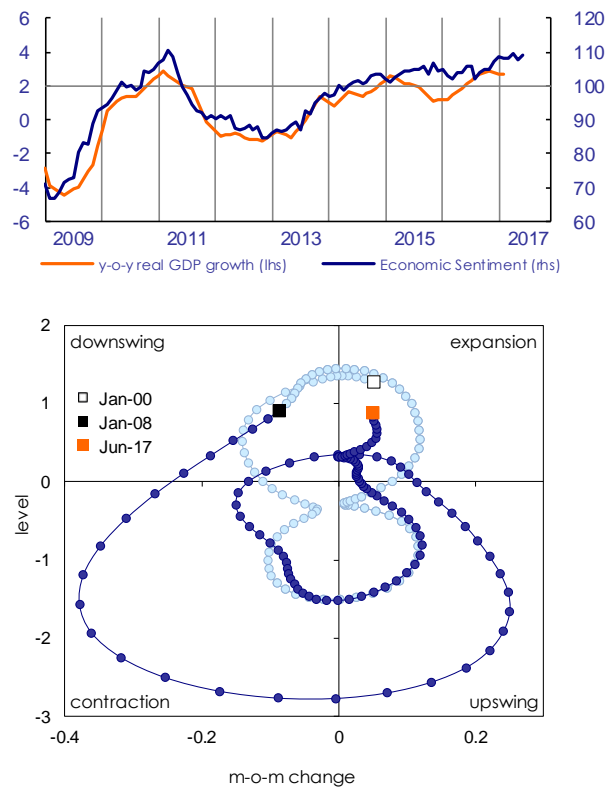
As the radar chart highlights (see Graph 1.2.8), confidence improved across sectors. Despite the particularly strong increase in construction, construction confidence stayed below its long-term average, while the other indicators remained well in excess of their respective long-term averages.

Graph 1.2.8: Radar Chart for Spain



Dutch sentiment improved in April, decreased in May and rose again in June, resulting in an overall slight improvement in June compared to March. At 109.2 points, the ESI finished 1.0 point higher on the quarter, extending further the excess over its long-term average of 100. Accordingly, the Dutch climate tracer (see Graph 1.2.9) moved further into the expansion area over Q2.

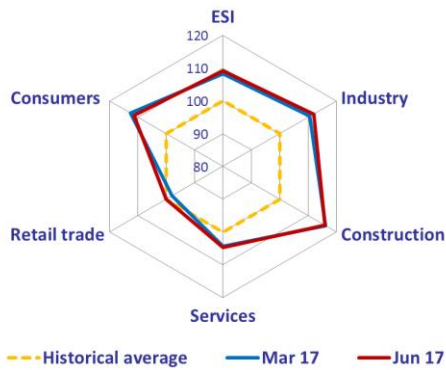
Graph 1.2.9: Economic Sentiment Indicator and Climate Tracer for the Netherlands



The Dutch radar chart (see Graph 1.2.10) shows that confidence remained broadly unchanged in industry, services and construction, while it improved slightly in the retail trade sector and registered a small decrease among consumers.

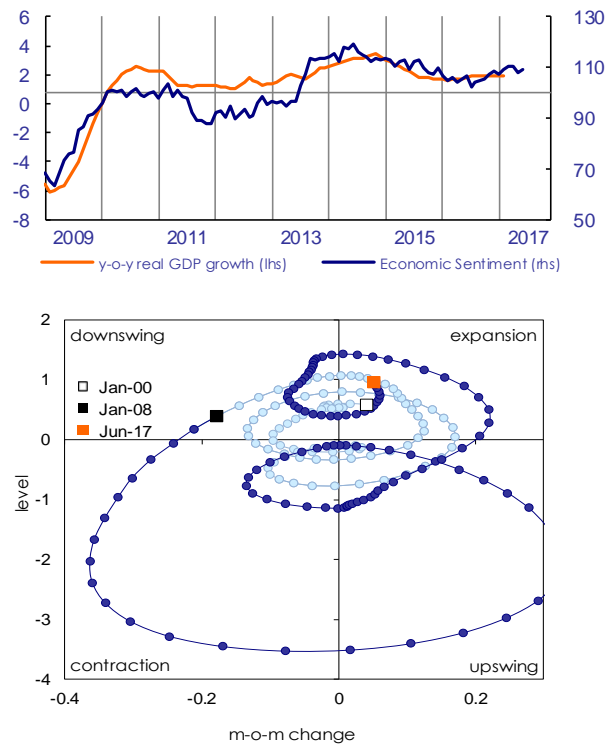
Compared to historic levels, confidence is particularly high among consumers and in the construction and industry sectors, while it is rather low in retail trade.

Graph 1.2.10: Radar Chart for the Netherlands



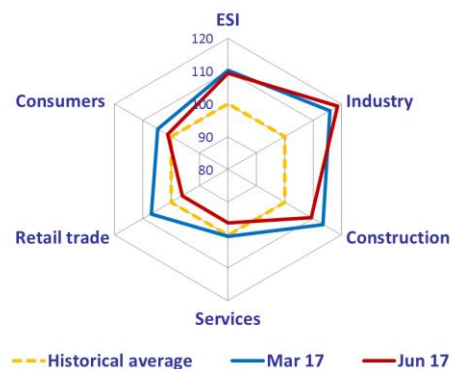
Sentiment in the **United Kingdom** remained virtually unchanged in April, dropped in May and recovered somewhat in June. Overall, the ESI came in 0.9 points lower on the quarter. At 109.3 points, it is still firmly above its long-term average of 100. Slightly lower sentiment tossed the UK climate tracer (see Graph 1.2.11) mildly in the direction of the downswing quadrant but the tracer remains in the expansion quadrant.

Graph 1.2.11: Economic Sentiment Indicator and Climate Tracer for the United Kingdom



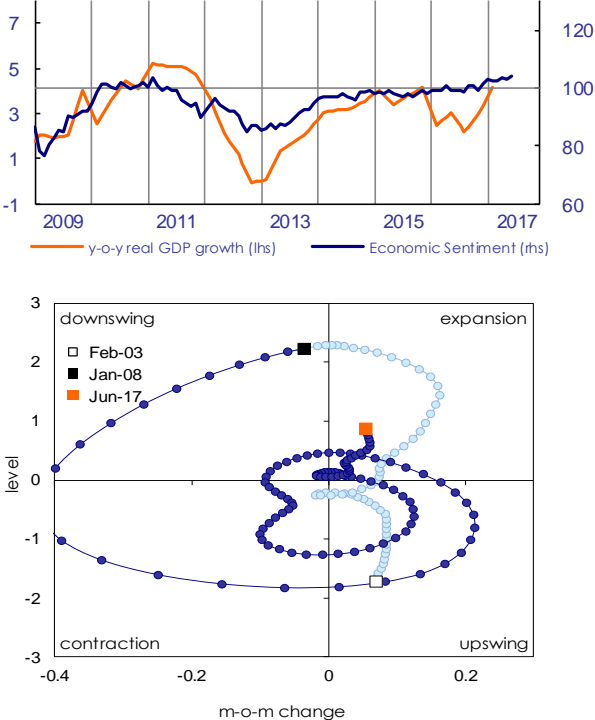
Focussing on sectoral developments, the radar chart for the UK (see Graph 1.2.12) shows that confidence increased only in the industry sector, while it cooled down among consumers and the other business sectors. The decrease has been particularly strong in the retail trade sector, while the decrease in construction is somewhat overstated by a positive outlier in March. The level of confidence in industry has actually reached a historical high, and remains well above long-term average also in construction. By contrast, sentiment is now below its long-term average in services and retail trade and still just above it for consumers.

Graph 1.2.12: Radar Chart for the UK

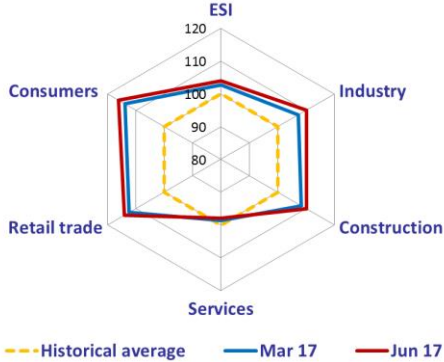


Thanks to strong improvements in April and June that offset a decrease in May, the **Polish** sentiment indicator finished Q2 1.3 points above its level in March. At 104.0, the indicator slightly extended its moderate distance to the long-term average. The improvement in sentiment moved the climate tracer for Poland further into the expansion quadrant (see Graph 1.2.13).

Graph 1.2.13: Economic Sentiment Indicator and Climate Tracer for Poland



Graph 1.2.14: Radar Chart for Poland



As the Polish radar chart (see Graph 1.2.14) shows, confidence has firmed across all sectors of the economy except for services, where it remained broadly stable. Services is also the only sector where confidence stood slightly below its long-term average.

2. SPECIAL TOPIC: ESI AND OTHER BCS INDICATORS VS PMI – PROPERTIES AND EMPIRICAL PERFORMANCE

Introduction

This special topic presents and compares the two most commonly used indicators for tracking euro-area GDP growth: the *composite output purchasing managers' index (PMI)* released by IHS Markit Economics and the *economic sentiment indicator (ESI)* for the euro area, released by the European Commission drawing on its comprehensive EU-wide Business and Consumer Survey (BCS) programme. The analysis is presented both on the level of aggregate economic indicators and of sectoral indicators for manufacturing and services.

Descriptive comparison between the PMI composite output index and the ESI for the euro area

Table 2.1 provides a summary of different features concerning the collection and processing of survey data for the composite output PMI and the ESI for the euro area.¹ The PMI is provided by Markit Economics,² while the ESI is provided by the European Commission's DG ECFIN in cooperation with partner institutes in the joint BCS programme.

Survey methods and fieldwork

For the PMI, Markit Economics both collects the survey data and processes the survey results. For the ESI, the BCS partner institutes

collect the national survey data and the processing is done jointly by the partner institutes and the European Commission. The European Commission notably computes the aggregate results for the euro area and the EU. Both surveys use harmonised questionnaires and the data are collected via postal mail, email, web, fax and phone. For the ESI, the monthly fieldwork falls under the responsibility of the partner institutes, which means that the survey methods can differ to some extent between countries.³ A fixed panel is used for the PMI survey. For the ESI, most partner institutes use a stratified random sample from a register of companies/households, a fixed panel or a combination of both. The PMI questionnaires are completed in the second half of each month, while for the ESI it is ten to fifteen working days starting on the first working day of each month.

The final PMI estimates are usually released on the third working day in the month after the collecting period. The ESI results are published earlier, namely on the next-to-last working day of each month. However, since June 2007, a PMI flash estimate for the euro area is published approximately ten days before the final releases, typically based on 85-90% of the total PMI survey responses (see section below on revisions in the survey data).

¹ For more information about the PMI, see e.g. the brochure at <http://www.markit.com/Product/File?CMSID=93430186005f4d829ef5c93181c8cd9> and the monthly press releases at <https://www.markiteconomics.com/Survey/Page.mvc/PressReleases>. For more information about the ESI, see European Commission (2017), The Joint Harmonised EU Programme of Business and Consumer Surveys – User Guide, February, https://ec.europa.eu/info/files/user-guide-joint-harmonised-eu-programme-business-and-consumer-surveys_en.

² Markit Economics is part of IHS Markit Ltd. The previous provider NTC Economics was acquired by Markit Group in April 2008.

³ For more information concerning the national institutes' survey methods, see the business and consumer metadata overviews for EU Member States at the European Commission DG ECFIN's web page https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys/methodology-business-and-consumer-surveys/metadata-partner-institutes_en.

Table 2.1: Comparison between the PMI composite output index and the ESI for the euro area

	<i>PMI composite output</i>	<i>ESI</i>
<i>Provider(s)</i>	Markit Economics	European Commission DG ECFIN and partner institutes
<i>Survey method</i>	Harmonised questionnaires via postal mail, email, web, fax and phone.	Harmonised questionnaires via postal mail, email, web, fax and phone.
<i>Collecting period, approx. monthly dates</i>	12-26 (12-22 for Flash)	1-23
<i>App. publication date, final (flash)</i>	Third working day in the month after the collecting period (Flash released around 6 working days before the end of each month)	Last but one working day each month
<i>Sample method</i>	Fixed panel	Stratified random samples and fixed panels
<i>Sample size</i>	5 000 companies	75 000 companies and 26 000 consumers
<i>Response rate for surveys</i>	75% (services) 80% (goal for composite)	65-80%
<i>Sectors (weights)</i>	Manufacturing (35%) and services (65%).	Manufacturing (40%), services (30%), consumers (30%), construction (5%) and retail trade (5%).
<i>Number of countries</i>	<u>Manufacturing</u> : 8 (Germany, France, Italy, Spain, the Netherlands, Austria, Ireland and Greece), covering about 90% of the value added in the industry for the euro area <u>Services</u> : 5 (Germany, France, Italy, Spain and Ireland), covering about 78% of the value added in the services for the euro area	18-19 (All euro-area countries except for Ireland, where only the consumer survey is provided)
<i>Number of questions</i>	2	15
<i>Questions</i>	<u>Manufacturing</u> : "Is the level of production/output at your company higher, the same or lower than one month ago?" <u>Services</u> : "Is the level of business activity at your company higher, the same or lower than one month ago?"	<u>Manufacturing</u> : orders, stocks and expected production. <u>Construction</u> : orders and expected employment. <u>Services</u> : business situation, demand and expected demand. <u>Retail trade</u> : business activity, stocks, expected business activity. <u>Consumers</u> : expected financial position, expected general economic situation, expected unemployment and expected savings.
<i>Aggregation method (answers)</i>	$D = P + (0.5*N)$, where D = diffusion index, P = positive and N = neutral.	$B = P - M$ where B = Balance, P = positive and M = negative.
<i>Seasonal adjustment</i>	X12	Dainties
<i>Data availability from month</i>	June 1997 (manufacturing) July 1998 (services and composite)	January 1985 (manufacturing, construction, consumers and ESI) October 1985 (retail trade) October 1996 (services)

Sample size and coverage

In terms of the number of countries and sectors included, the ESI has by far the most complete set for the euro area. The ESI covers five sectors (manufacturing, construction, market services, retail trade and consumers) and all of the euro-area countries, while the PMI composite output index covers two sectors only (manufacturing and market services) and less than half of the member countries. The sample size is also higher for the ESI, with about 75 000 companies and about 26 000 households compared to the PMI that covers about 5 000 companies.

Survey questions and aggregation methods

Both the PMI and the ESI are composite indices, i.e. they are composed of several survey questions. The PMI composite output index combines two questions concerning manufacturing production and services business activity. The ESI is composed of 15 survey questions from the five above-mentioned sectors, concerning for instance production, orders, stocks and business activity. The sectoral survey questions entering the ESI are weighted to reflect the approximate economic weight of the different sectors. The ESI includes questions about the current and past situation but also about expectations about future developments. This is not the case for the headline PMI that only includes questions about the current situation. However, since

January 2017, new PMI future output indices have been made available separately, which are going back to July 2012.⁴

For both the ESI and the PMI, the selected survey questions are also used for the computation of sector-specific indicators. In case of the sectoral BCS confidence indicators, the component questions are equally weighted and their selection reflects a compromise between correlation (with the target series), smoothness, robustness and lead. For instance, the industry confidence indicator is computed as the average of the questions about current stocks and order books as well as production expectations (3 months ahead).

PMI questions have three response options, while the ESI questions have three for the business-sector questions and six for the consumer questions. Generally the alternatives are "increase", "remain unchanged" and "decrease", while the six-answer alternatives of the consumer survey allow the respondent to indicate the degree of change ("a lot, a little") and also a "don't know" alternative. The aggregation method of the PMI takes into account the positive and neutral answers, while the BCS makes use of the positive and negative ones. The PMI survey aggregates the answers into 'diffusion indices', while the BCS aggregates correspond to 'balances' of opinions. Both the PMI indices and the BCS balances are seasonally adjusted by different methods.

The PMI diffusion index works as follows: if all of the respondents report an increase, the index is 100. If everyone reports a decrease, the index is zero. If all of the respondents see no change, the index is 50 (due to $0.5 \cdot N$). Therefore, an index reading of 50 means that the variable is unchanged, a number over 50 indicates an improvement, while a number below 50 suggests a decline. The further away the index is from 50, the stronger is the change over the month.

The balances in the BCS are calculated as the difference between the percentage shares of positive and negative answers and can thus range from +100 to -100. Unlike the sectoral confidence indicators and underlying BCS questions, the ESI is not a balance, but a dimensionless index; it is standardised to have a long-term mean of 100 and a standard deviation of 10. An index value greater than 100 indicates an above-average economic sentiment, a value below 100 indicate a below-average position, while a value of 100 indicates an average economic sentiment.

In order to obtain country weights for the euro-area sector aggregates, the BCS uses references series such as gross value added and private consumption expenditure. In the PMI, gross value added series are used to obtain country weights. In both surveys the country weights are updated on an annual basis. Finally, fixed sector weights are used to calculate both the composite PMI and the ESI. In both surveys, the weight for the manufacturing sector is of a similar size, 35% for the PMI and 40% for the ESI. However, the services sector accounts for the rest of the weight in the PMI composite (65%), while its weight is only 30% in the ESI, with the remaining weights coming from consumers, retail trade and construction.

Revisions in the survey data

Since June 2007, a PMI flash estimate for the euro area has been calculated for the overall composite indicator as well as for the manufacturing output index and the services activity index. The flash is published approximately ten days before the final releases and is typically based on 85-90% of the total PMI survey responses. The ESI is not normally subject to revisions.⁵ By contrast, the revisions in the PMI can be substantial, as can be seen in Graph 2.1.

Since August 2012, the revisions of the PMI composite output index range between +/- 0.8

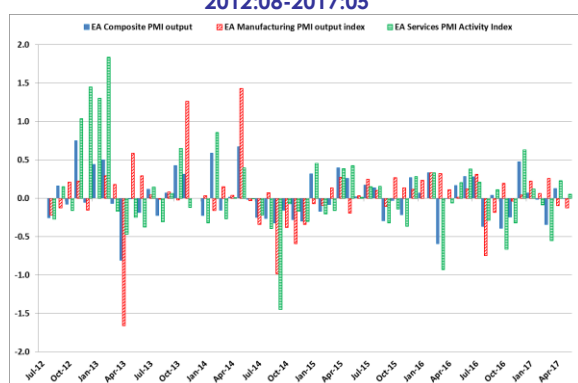
⁴ For the new PMI future output/activity indices, panellists are asked whether they expect output/activity to rise, fall, or remain the same over the next 12 months. For services, the future activity index is already available as from July 1998.

⁵ Small revisions in the business survey data for France each month can sometimes lead to marginal revisions for the euro area/EU as a whole.

percentage points with an average absolute revision of 0.24 pp.⁶ Since the PMI's average is approximately half of the ESI's, this would be equivalent to revisions of the ESI by 0.5 points. For the composite index, 17 of the revisions have been larger than the series' standard deviation. Such large revisions of the last observation may be problematic for nowcasting accuracy. For the sectoral PMI indices, the range and standard deviation have been even higher than for the composite index. The average revision is close to zero for all three indices, implying no bias in the revisions.

The purpose of the flash estimate is to "provide an accurate advance indication" of the final PMI. A basic requirement for the flash estimate is then to change in the same direction as the final estimate. The calculations show that the flash estimate has indeed changed in the same direction as the final PMI in the majority of cases. This is especially the case for the composite index. However, there are a number of occasions, in particular for the manufacturing and services indices, when the flash and the final estimates indicate different directions (respectively 11 and 10 out of 58). Changes of direction of the last observation may result in misleading projections when using the series for nowcasting.

Graph 2.1: Revisions in the euro-area PMI estimates 2012:08-2017:05



Source: IHS Markit, computation by Commission services

⁶ The data for euro-area flash PMI estimates from August 2012 are collected from internal databases and from Markit Economics' press releases on the internet.

Performance comparison between the PMI and BCS indicators

This section compares the euro-area PMI indicators to the BCS equivalents. The focus is on how the indicators perform in relation to an appropriate reference series of economic activity. The comparisons are made in terms of correlations, frequency of directional co-movements and predictive power. A high positive correlation between two time series means that they are broadly co-moving over time. An ideal indicator series should lead or coincidentally co-move with the reference series, i.e. not lag the series. However, given the publication lag of the reference series (official statistics) of usually at least 1.5 months compared to the survey data, even a survey series lagging by one month would still have an information lead. The frequency of directional co-movements gives an indication how well the series are coincidentally co-moving together. The predictive power of an indicator measures how close on average the predictions using the indicator series in a simple bivariate model in pseudo real-time are to the outcomes of the reference series.

All comparisons in this section are made for the total economy, industry and services. Apart from the ESI and the INDU and SERV sectoral confidence indicators, results are also presented for a (notional) composite indicator using only questions from the INDU and SERV surveys of the BCS programme, thus mimicking the composition of the composite PMI (see note to Table 2.2 for details). In addition to the PMI composite output index and its manufacturing and services components, the comparison also comprises the new PMI *future* output/activity indices, which (apart from the future activity index for services) are available only since 2012.

Correlations

Overall economic activity

Tables 2.2 and 2.2bis show coincident and leading correlations and the frequency of co-movements between the composite PMI and several BCS indicators vis-à-vis euro-area GDP growth. Table 2.2 shows that the PMI and the BCS indicators are highly correlated with euro-area GDP growth. The indicators are generally also better correlated with GDP measured as

y-o-y percentage changes than measured as q-o-q percentage changes. ESI has the highest coincident correlation with y-o-y GDP growth, the PMI with q-o-q GDP growth. Moreover, all the BCS indicators show a high coincident correlation with y-o-y GDP growth. The PMI and the notional indicator INDU5+SERV3 have the highest correlations with y-o-y GDP growth registered with a one-quarter lead (though not significantly higher than the ESI's).

The frequency of co-movements of the indicators is higher for y-o-y GDP growth than for q-o-q growth. The indicator INDU5+SERV3 has the highest frequency of co-movements with y-o-y GDP growth among the indicators (above 8 out of 10). All indicators show an equally poor frequency of co-movements with q-o-q GDP growth (around 6 out of 10).⁷

Table 2.2: PMI composite output index and BCS indicators vis-à-vis euro-area GDP growth 1998q3-2017q1

	PMI comp.	ESI	INDU+SERV ¹	INDU5+SERV3 ²
<i>GDP y-o-y % changes</i>				
Correlation at lead one	0.92	0.89	0.86	0.92
Coincident correlation	0.84	0.94	0.94	0.93
Frequency of co-movements (%)	75.7***	74.3***	77.0***	82.4***
<i>GDP q-o-q % changes</i>				
Correlation at lead one	0.63	0.49	0.42	0.54
Coincident correlation	0.85	0.74	0.69	0.80
Frequency of co-movements (%)	62.2**	60.8**	58.1*	60.8**

Note: 1) The indicator is the weighted average between the Industry Confidence Indicator (INDU) and the Services Confidence Indicator (SERV). 2) The indicator is the weighted average between the following questions: "How do you expect your production will develop over the next 3 months?" (INDU5) and "How do you expect demand (turnover) for your company's services to change over the next 3 months?" (SERV3). 1) - 2). The weights used to calculate the indicators are fixed (manufacturing 57% and services 43%) and correspond to the ESI weighting scheme. Bold denotes the best performer for any given criterion. Asterisks denote if the frequency of co-movements is significantly better than a random guess: * at the 10% threshold, ** at the 5% threshold, *** at the 1% threshold. Source: Commission services.

Table 2.2bis shows the same correlations over a shorter sample from 2012Q3, as this is the first available observation of the new PMI composite future output index. Over this short sample the BCS indexes outperform the PMI indexes compared to y-o-y GDP growth. Furthermore, the INDU5+SERV3 index shows the highest correlation with q-o-q GDP growth

one quarter ahead. On the other hand, the PMI composite future index shows the highest coincident correlation and has the highest frequency of co-movements with q-o-q GDP growth - however none of the indexes shows a frequency of co-movements with GDP growth significantly better than a random guess at the 95% threshold. Finally, the PMI composite shows a higher correlation with the lag of q-o-q GDP growth, while the PMI future output and ESI show a higher correlation with current q-o-q GDP growth. Overall, in the last 4 years, the ESI has been as good as the PMI composite in terms of tracking q-o-q GDP growth. The new PMI composite future output appears to be only marginally better than the PMI composite index, but is not as good as the notional BCS index INDU5+SERV3, which shows the highest correlation with both q-o-q and y-o-y GDP growth at a one-quarter lead.

Table 2.2bis: PMI composite output index and BCS indicators vis-à-vis euro-area GDP growth 2012q3-2017q1

	PMI comp.	PMI comp. Future output	ESI	INDU+SERV ¹	INDU5+SERV3 ²
<i>GDP y-o-y % changes</i>					
Correlation at lead one	0.81	0.77	0.82	0.81	0.82
Coincident correlation	0.95	0.89	0.97	0.97	0.94
Frequency of co-movements (%)	61.1	61.1	61.1	66.7	72.2
<i>GDP q-o-q % changes</i>					
Correlation at lead one	0.56	0.60	0.60	0.61	0.66
Coincident correlation	0.76	0.80	0.76	0.74	0.78
Frequency of co-movements (%)	50.0	72.2	50.0	44.4	61.1

Source: Commission services.

Manufacturing

Table 2.3 and 2.3bis provide performance measures for the PMI manufacturing output index and several BCS industry indicators vis-à-vis (monthly) euro-area industrial production growth. The general conclusions for the overall economy indicators hold for the manufacturing indicators as well: the correlations are high between all indicators and industrial production growth and generally higher when measuring growth in y-o-y rather than in 3-month-on-3-month percentage changes. The BCS indicator INDU1 (past production assessment) has the highest coincident correlation with y-o-y industrial production growth and, together with INDU5 (production expectations), also shows the highest correlation with IP growth one month ahead. The PMI's correlation with y-o-y industrial production growth is significantly lower. There are no significant differences in terms of correct directional forecasts.

The manufacturing PMI performs best in terms of coincident correlation with

⁷ Generally, all the BCS indicators have a higher correlation with the lag of the GDP q-o-q growth, while the PMI shows a higher correlation with the current GDP q-o-q growth.

3-month-on-3-month industrial production growth, closely followed by the BCS indicator INDU5. Overall, the BCS indicators slightly outperform PMI when it comes to tracking y-o-y industrial production growth and vice versa for 3-month-on-3-month industrial production growth.

Table 2.3: PMI manufacturing output index and BCS industry indicators vis-à-vis euro-area industrial production 08/1997-04/2017

	PMI manu.	INDU	INDU1	INDU5
<i>IP y-o-y% changes</i>				
Correlation one month ahead	0.83	0.88	0.91	0.91
Coincident correlation	0.78	0.89	0.92	0.88
Frequency of co-movements (%)	58.1***	56.8**	50.8	55.9**
<i>IP 3m-o-3m% changes</i>				
Correlation one month ahead	0.81	0.56	0.61	0.73
Coincident correlation	0.83	0.64	0.70	0.78
Frequency of co-movements (%)	59.3***	55.5***	57.2***	53.8**

Note: See Table 2.1 for the survey question used for the PMI manufacturing output index. See note to Table 2.3 for the survey questions used for the BCS industry indicators. Bold denotes the best performer for any given criterion.

Source: Commission services.

Table 2.3bis shows a restricted sample from Q3 2012, the first available observation of the new PMI manufacturing future output index. Over this short sample the BCS indexes generally outperform the PMI manufacturing index across the different performance criteria, except for the frequency of co-movements - however none of the indexes shows a frequency of co-movements with industrial production significantly better than a random guess at the 95% threshold. The new PMI manufacturing future output appears to be better than the conventional PMI manufacturing index and also the INDU confidence indicator in tracking 3m-o-3m IP growth. Compared to the BCS INDU5 indicator (production expectations), the PMI manufacturing future output shows only a slightly better correlation with 3m-o-3m IP growth coincident and one-month ahead, while the BCS INDU5 indicator shows the highest correlation two months ahead (not shown in the table). Overall, over the last 4 years, the BCS indicator INDU5 outperforms the conventional PMI manufacturing index according to most measures, and performs broadly at par with the new PMI manufacturing future output.

Table 2.3bis: PMI manufacturing output index and BCS industry indicators vis-à-vis euro-area industrial production 09/2012-04/2017

	PMI manu.	PMI manu. Future output	INDU	INDU1	INDU5
<i>IP y-o-y% changes</i>					
Correlation one month ahead	0.73	0.71	0.77	0.74	0.77
Coincident correlation	0.75	0.71	0.79	0.74	0.78
Frequency of co-movements (%)	49.1	47.3	49.1	36.4	49.1
<i>IP 3m-o-3m% changes</i>					
Correlation one month ahead	0.48	0.59	0.48	0.47	0.55
Coincident correlation	0.50	0.52	0.44	0.43	0.47
Frequency of co-movements (%)	56.4	61.8*	49.1	49.1	49.1

Source: Commission services.

Services

Table 2.4 displays the performance results for the PMI services business activity index and two BCS services indicators vis-à-vis euro-area growth in services (value added). Also the results for the services indicators are generally in line with those for the overall economy and manufacturing indicators. The BCS services indicators have a correlation with y-o-y growth in services which is in line with (one-quarter ahead) or significantly higher than (coincident) that of the PMI, and the BCS services confidence indicator has the highest frequency of directional co-movements. For q-o-q growth in services value added, the PMI has a significantly higher coincident correlation and a higher frequency of co-movements.⁸ Finally, the PMI services future activity is slightly better than the conventional PMI services index only with regard to q-o-q growth one quarter ahead, but is otherwise performing worse.

Table 2.4: PMI services business activity index and BCS services indicators vis-à-vis euro-area value added in services 1998q3-2017q1

	PMI serv.	PMI serv. Future activity	SERV	SERV3
<i>VA services y-o-y% changes</i>				
Correlation at lead one	0.90	0.73	0.89	0.88
Coincident correlation	0.81	0.56	0.90	0.88
Frequency of co-movements (%)	68.9***	62.2*	73.0***	63.5**
<i>VA services q-o-q % changes</i>				
Correlation at lead one	0.70	0.74	0.60	0.63
Coincident correlation	0.84	0.75	0.75	0.75
Frequency of co-movements (%)	67.6***	58.1*	62.2**	56.8

Note: See Table 2.1 for the survey question used for the PMI manufacturing output index. See note to Table 2.3 for the survey questions used for the BCS industry indicators. Bold denotes the best performer for any given criterion.

Source: Commission services.

Table 2.4bis shows a shorter sample from Q3 2012. Over this recent sample the BCS indexes

⁸ In terms of lead/lag characteristics, the BCS indicators have a higher correlation with the lag of the q-o-q growth in services, while the PMI shows a higher correlation with current q-o-q growth.

generally perform at par with the PMI indexes, except for the frequency of co-movements with the q-o-q growth in services, where the PMI services future index has the highest frequency - however none of the indexes shows a frequency of co-movements significantly better than a random guess at the 95% threshold. On the other hand, especially the third question of the BCS survey (demand expectations) outperforms the PMI indicators in terms of correlation with q-o-q growth one-quarter ahead. The slight lagging behaviour observed over the longer sample (Table 2.4) seems to have disappeared: like the PMI, the BCS indicators show a maximum correlation with the current q-o-q growth in services. Overall, the performance of the BCS services indicators compared to the PMI series has improved over the last 4 years.

Table 2.4bis: PMI services business activity index and BCS services indicators vis-à-vis euro-area value added in services 2012q3-2017q1

	PMI serv.	PMI serv. Future activity	SERV	SERV3
<i>VA services y-o-y % changes</i>				
Correlation at lead one	0.77	0.77	0.79	0.80
Coincident correlation	0.93	0.89	0.94	0.93
Frequency of co-movements (%)	61.1	61.1	61.1	55.6
<i>VA services q-o-q % changes</i>				
Correlation at lead one	0.51	0.57	0.57	0.60
Coincident correlation	0.69	0.68	0.64	0.65
Frequency of co-movements (%)	61.1	72.2	50.0	44.4

Source: Commission services.

Short-term predictive power of the indicators

This section investigates the survey indicators' predictive power for the reference series for the overall economy, manufacturing and services.

The forecast model is specified as:

$$(1) \quad y_t = \alpha + \beta_0 SI_t + \beta_1 (SI_t - SI_{t-1}) + \varepsilon_t$$

where y is the reference series and SI is the survey indicator.

The model is run using as the reference series the growth rates of either euro-area real GDP, industrial production (IP) or services value-added. In the case of euro-area real GDP, the survey indicator is either the ESI, the PMI output indicator, the INDU+SERV or the INDU5+SERV3 indicators. When IP is the target variable, the survey indicators are: PMI manufacturing output, the BCS confidence indicator in industry (INDU), INDU1 and INDU5. Finally, for the services value-added, the explanatory variables are: PMI services, PMI services future activity, BCS services

confidence indicator (SERV), SERV1, SERV2 and SERV3. The model is run using both q-o-q and y-o-y growth (in this case the third term of equation (1) becomes $\beta_1 (SI_t - SI_{t-4})$).

Data are available since 1998q1 and the out-of-sample period under investigation runs from 2010q2 to 2017q1 (April 2017 in the case of Industrial Production).

To compare the nowcasting performance of the models using the different survey indicators, root mean squared errors (RMSE) and the percentage of correctly forecasted changes in the direction of the reference series are reported (see Table 2.5).

Overall economic activity

The results show that - for y-o-y GDP growth - BCS indicators perform clearly better than the PMI in terms of RMSE. The lowest RMSE is reached using the ESI or the combination of industry and services confidence indicators (INDU+SERV). By contrast, looking at q-o-q GDP growth, the PMI indicator performs generally better, while only insignificantly so vis-à-vis the combination INDU5+SERV3 of the BCS. All the indicators correctly forecast the direction of q-o-q growth in most of the cases (the highest share of correct directional forecasts is reached using INDU+SERV). The BCS indicators perform better than the PMI in forecasting the directional changes in y-o-y growth. The highest share is reached using the ESI as explanatory variable.

Table 2.5: Performance of the PMI composite output index and the BCS indicators to nowcast euro-area GDP growth. Out-of-sample period: 2010q2 - 2017q1

	PMI comp.	ESI	INDU+SERV	INDU5+SERV3
<i>GDP y-o-y % changes</i>				
RMSE	0.63	0.52	0.52	0.58
% of correctly forecasted direction	60.7	75.0**	67.9	71.4*
<i>GDP q-o-q % changes</i>				
RMSE	0.25	0.29	0.29	0.26
% of correctly forecasted direction	75.0**	75.0**	78.6**	75.0**

Source: Commission services.

Manufacturing

Table 2.6 shows performance measures of model (1) using the PMI manufacturing output index and several BCS industry indicators to nowcast euro-area industrial production growth. In this case all the BCS indicators perform slightly better than the PMI also to forecast q-o-q growth of industrial production (the lowest RMSE is reached using the confidence

indicator INDU as explanatory variable). Also in the y-o-y case, INDU produces the lowest RMSE. Like for the overall economy, the percentage of correct directional forecasts is quite high for all indicators when forecasting q-o-q IP growth. Concerning y-o-y IP growth, the results are quite good for PMI manufacturing and INDU5, while not significantly different from a random guess at the 95% threshold for INDU and at the 90% threshold for INDU1.

Table 2.6: Performance of the PMI manufacturing output index and the BCS indicators to nowcast euro-area industrial production growth. Out-of-sample period: 2010q2 – 2017q1

	PMI manu.	INDU	INDU1	INDU5
<i>IP y-o-y % changes</i>				
RMSE	2.96	1.72	1.87	2.58
% of correctly forecasted direction	71.4***	64.3*	57.1	71.4***
<i>IP q-o-q % changes</i>				
RMSE	1.14	1.03	1.13	1.08
% of correctly forecasted direction	67.9***	71.4***	64.3**	71.4***

Source: Commission services.

Services

Table 2.7 shows performance measures of model (1) using the PMI services business activity index and several BCS services indicators vis-à-vis euro-area growth in services (value added). In terms of RMSE, the BCS indicators perform markedly better than the PMI when value added in services is considered in y-o-y terms, while the PMI shows better results than the BCS indicators for q-o-q growth. It is worth noting that the PMI services future activity index shows a worse nowcasting performance than its conventional counterpart. Concerning correct directional changes, the highest score is reached for managers' assessment of past demand (SERV1) for both y-o-y and q-o-q growth.

Table 2.7: Performance of the PMI services output index and the BCS indicators to nowcast growth in euro-area value added in services. Out-of-sample period: 2010q2 – 2017q1

	PMI serv.	PMI future	SERV	SERV1	SERV2	SERV3
<i>SERV - VA y-o-y % changes</i>						
RMSE	0.70	0.87	0.64	0.77	0.68	0.61
% of correctly forecasted direction	67.9	53.6	82.1**	85.7**	67.9	64.3
<i>SERV - VA q-t-q % changes</i>						
RMSE	0.24	0.30	0.28	0.29	0.30	0.30
% of correctly forecasted direction	75.0**	71.4*	78.6**	82.1***	75.0**	67.9

Source: Commission services.

Summary and concluding remarks

While the European Commission's business and consumer survey and Markit's PMI survey have very similar properties, there are several

structural differences, such as the countries and sectors included, the questions included in the indicators, whether the indicators are later revised or not, and the seasonal adjustment method. Several comparisons were carried out to assess the impact of these differences.

All in all, the BCS indicators show higher correlations with y-o-y growth in the references series (GDP, IP, value added in services), while the PMIs generally show higher correlations with q-o-q growth. However, it is worth noting that in recent years (post-crisis), the results are less clear, with the BCS and PMI performing more or less equally in terms of correlations.

In terms of nowcasting power, using simple standard bridge models, the BCS indicators are generally better in predicting y-o-y growth in the references series. While the PMI appears to outperform the BCS indicators in nowcasting q-o-q growth in GDP and value added in services, the European Commission's Industrial Confidence Indicator gives also better results in terms of nowcasting q-o-q IP growth.

When interpreting these results, it is important to note that all comparisons were made using the *final* PMI indexes, which are only available at the beginning of the month following the data collection, i.e. between 2 and 5 days after the European Commission's BCS release. The flash PMIs, which arguably receive most attention due to their earlier availability, can differ quite substantially from the final PMIs, both in magnitude and direction of change. The presented results are therefore likely biased in favour of the PMI, i.e. the results of a real-time comparison using PMI flash releases would be different. Another interesting finding is that the new PMI future output indexes do not seem to perform better than their conventional coincident counterparts.

Concerning the BCS indicators, the analysis showed that, in terms of both forecasting power and correlation, the sectors and questions included in the indicators make a difference. For instance, question 5 of the industry survey and question 3 of the services survey, both conveying managers' expectations, show good performances. Combining only these two forward-looking questions appears to create an effective composite survey indicator, similar in terms of questions included to the PMI

composite output index. This new alternative BCS indicator and the PMI composite index perform virtually identically in terms of nowcasting q-o-q GDP growth.

Finally, one important difference between the PMI and the European Commission's BCS surveys is the partial country and sectoral coverage of the former. While the focus here was on the performance of the survey indicators at the aggregate euro area level only, the complete coverage of the harmonised BCS program of all euro area and EU countries across sectors allows for a coherent and much more detailed overview and comparison of business cycle developments across EU Member States.

ANNEX

Reference series

Confidence indicators	Reference series from Eurostat, via Ecwin (volume/year-on-year growth rates)
Total economy (ESI)	GDP, seasonally- and calendar-adjusted
Industry	Industrial production, working day-adjusted
Services	Gross value added for the private services sector, seasonally- and calendar-adjusted
Consumption	Household and NPISH final consumption expenditure, seasonally- and calendar-adjusted
Retail	Household and NPISH final consumption expenditure, seasonally- and calendar-adjusted
Building	Production index for building and civil engineering, trend-cycle component

Economic Sentiment Indicator

The economic sentiment indicator (ESI) is a weighted average of the balances of replies to selected questions addressed to firms and consumers in five sectors covered by the EU Business and Consumer Surveys Programme. The sectors covered are industry (weight 40 %), services (30 %), consumers (20 %), retail (5 %) and construction (5 %).

Balances are constructed as the difference between the percentages of respondents giving positive and negative replies. EU and euro-area aggregates are calculated on the basis of the national results and seasonally adjusted. The ESI is scaled to a long-term mean of 100 and a standard deviation of 10. Thus, values above 100 indicate above-average economic sentiment and vice versa. Further details on the construction of the ESI can be found [here](#).

Long time series (ESI and confidence indices) are available [here](#).

Economic Climate Tracer

The economic climate tracer is a two-stage procedure. The first stage consists of building economic climate indicators, based on principal component analyses of balance series (s.a.) from five surveys. The input series are as follows: industry: five of the monthly survey questions (employment and selling-price expectations are excluded); services: all five monthly questions; consumers: nine questions (price-related questions and the question about the current financial situation are excluded); retail: all five monthly questions; building: all four monthly questions. The economic climate indicator (ECI) is a weighted average of the five sector climate indicators. The sector weights are equal to those underlying the Economic Sentiment Indicator (ESI, see above).

In the second stage, all climate indicators are smoothed using the HP filter in order to eliminate short-term fluctuations of a period of less than 18 months. The smoothed series are then normalised (zero mean and unit standard deviation). The resulting series are plotted against their first differences. The four quadrants of the graph, corresponding to the four business cycle phases, are crossed in an anti-clockwise movement and can be described as: above average and increasing (top right, 'expansion'), above average but decreasing (top left, 'downswing'), below average and decreasing (bottom left, 'contraction') and below average but increasing (bottom right, 'upswing'). Cyclical peaks are positioned in the top centre of the graph and troughs in the bottom centre. In order to make the graphs more readable, two colours have been used for the tracer. The darker line shows developments in the current cycle, which in the EU and euro area roughly started in January 2008.

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